and which has lately been made a subject of research by G. von Koch, the costæ are in solitary specimens clad each with a longitudinal rib composed of a double row of rhomboidal calcareous scales placed close together at an angle to one another as shown in the figure. These rows of scales form an almost complete outer covering to the corallum. The scales seem to be wanting in colonial specimens. They are extremely conspicuous and definite in some of the best preserved solitary specimens, and their regularity of disposition is such that it is impossible to believe that they do not definitely belong to the coral. They are shown enlarged in the figure. In vertical sections of the coral they are seen to be attached at their bases to the wall of the calicle. In *Syringophyllum organum* similar scales occur covering the exterior of the corallum, but these have a remarkable definite form somewhat like that of the bowl of a teaspoon with the handle cut off short.

FIG. 6.—*Pholidophyllum tubulatum*. A calicle viewed from the side to show the rib-like prominences formed upon the costæ by the double rows of calcareous scales.

As an illustration of the possibility of Anthozoa bearing opercula and scales, but not as implying any direct relationship between the Operculata and the Alcyonaria, Prof. Lindström points to the structure of *Primnoa lepadifera*, and figures one of the polyps viewed from above, showing how eight of the valve-like calcareous scales present in this species close in over the summit of the polyp, forming a conical operculum over it somewhat as in Goniophyllum, whilst the remaining scales form a representative of the calicle. He shows that, as in Goniophyllum, the opercular valves differ in form and size according to their position when *in situ*.

In his concluding paragraph he states that he considers the Calceolidæ to be probably nearly allied to such forms as Cmphyma and Chonophyllum, whilst the Aræopomatidæ, on account of their vesicular internal structure, approach more nearly to Cystiphyllum. He does not consider the presence or absence of an operculum in corals to be necessarily of an important classificatory value, and cites the case of the presence and absence of opercula in Gastropoda as a parallel one of minor systematic importance. In this it is rather difficult to agree with him. Of course the opercula in Gastropods and corals are alike only in name, and as they occur so rarely in the latter the suspicion naturally arises that the two groups of the operculate corals may be more closely allied than he suspects. However, no man knows them better than he, or has a better right to an opinion on the subject, and his conclusion, guarded as it is, must be treated with all respect.

A very interesting result attained and given in tabular form on p. 91 is that in successive Upper Silurian strata a series of three modifications of form of *Goniophyllum pyramidale*, starting from *Goniophyllum pyramidale, primigena*, the form occurring in the lowest beds can be traced succeeding one another in time. Similarly *Rhizophyllum Gothlandicum, forma primaria* passes by a modification, *R. G. mutalia*, into *R. Gervillei*, of specific rank in the Devonian formations. Other operculate corals show similar modifications in progress of geological time. Prof. Lindström's important memoir cannot here be followed farther. It is illustrated by nine lithographic plates most beautifully executed in Stockholm, from which the engravings here given are copied, and are some of the most excellent ever published of corals.

H. N. MOSELEY

BARON NORDENSKJÖLD'S EXPEDITION TO GREENLAND

[THE following Programme, drawn up by Baron Nordenskjöld for his expedition to Greenland, has been kindly placed at our disposal by Mr. Oscar Dickson, who, with his well-known enlightened liberality, provides all the expenses. The Programme has not hitherto been made public, even in Sweden, as Baron Nordenskjöld did not wish to be interrupted in his preparations with correspondence on his plans and theories. The expedition leaves Sweden in the *Sofia* on the 20th instant, and will call at Thurso, where Baron Nordenskjöld will join the vessel.]

NINE centuries have elapsed since the Norwegian, Erik Röde, discovered Greenland, and founded Scandinavian Colonies; from these, Norwegian navigators some ten years after sailed south to "Vinland," the fecundus, *i.e.* to the shores of the present Canada and the United States, thereby acquiring the honour for the Norse race of being the real discoverers of the New World. It is not known whether these voyages led to any fixed settlements being established in America, but we know, on the other hand, from a number of Icelandic sources, that the colonies in Greenland became very flourishing. There were upwards of three hundred farms, "Gaarde," of which about two hundred, embracing twelve parishes, were situated in the "Österbygd," and about one hundred, embracing three or four parishes, were situated in the "Vesterbygd." During four centuries the country formed a bishopric, from which funds towards the Holy Wars were even contributed. Unfortunately, the connection between the colonies and the mother country ceased after a couple of centuries, while Greenland's ancient Norse population was extirpated, either through plagues or by "Skrællings," *i.e.*, the Eskimo who descended from the North. Another explanation of their disappearance is that they lost their nationality, and were absorbed into the Eskimo population, during their contact with the more numerous tribes of the Polar regions, whose mode of living was more suited to the climate of the country and the resources at their disposal. However that may be, there remains the fact that one of the most distinct and enterprising peoples in the world have been annihilated, or, perhaps, absorbed in one distinguished as among the lowest, both physically and intellectually. The old country, belonging to the Norwegian Crown, was even so far forgotten, that it was only Columbus's discovery in the south which recalled the attention of the Norsemen to the fact that they had once colonised a part of this world, which was being parcelled out among the southern nations by "Bulls" from Rome, as if it had just been discovered.

By the aid of traditions and old journals of navigation several attempts were made to reach the old, forgotten colonies from Iceland, but these were frustrated by the enormous masses of drift ice, which then seemed to inclose the shores of Greenland's east coast, more than formerly. Eventually, John Davis, in his attempts to find the north-west passage, discovered that the west coast was easily reached, and that the seas around it offered a fine hunting-ground for the profitable whale-fisheries. This, with the reported discovery of gold in the country resulted in the despatch of several Danish hunting and commercial expeditions, which did not, however, meet with much success, until the Norwegian,

Hans Egede, by his zeal for bringing the blessings of the Gospel to the descendants of the old Norse colonists, caused trading and missionary stations to be established on the west coast. These were subsequently considerably augmented and extended, and henceforth held by the Danish crown, under "The Commercial Association of Greenland."

Greenland was thus inhabited by Norsemen from 983 until the 15th century, and its west coast has, during the last hundred and sixty years, been a place of sojourn for many able Danish administrators and missionaries. Besides this, nearly all expeditions which have been bound for the American Polar sea have stayed here more or less, while the west coast has on many occasions been the object of carefully prepared expeditions of research. This part of Greenland is, therefore, scientifically and ethnographically one of the best-known of the Arctic lands. But in spite of this we encounter here several of those *lacunæ* in the knowledge of the globe which it is of great importance that we should fill up, and some of these it is now my intention to deal with.

The east coast of Greenland was visited in 1822 by the Englishman, Scoresby, jun., and in 1823 by Sabine and Clavering, in 1829-30 by the Dane, W. A. Graah, as well as by the second German expedition under Koldewey in 1868-69, and also by some whalers. It is, however, in its greatest extent wholly unknown, a circumstance, which must be detrimental to the proper understanding of the history of the first Norse colonisation of Greenland, and of early voyages of conquest and discovery therefrom to the shores of America. Thus, until the east coast of Greenland is fully explored, one must continue to doubt the very forced explanation of the site of these colonies which is now predominant in the world of science. And it is, on the other hand, not worthy of the geographical discoveries of the 19th century, that a coast-line extending south to the latitude of Stockholm should be so utterly a *terra incognita*.

The interior of Greenland is even less known than the east coast, and here we encounter a purely scientific problem, whose great importance is apparent from the circumstance that the unestablished theory,—that the interior of the island is one continuous mass of ice,—forms one of the corner stones in glacial science, which again is closely connected with several of the fundamental principles of modern geology. If we except a trip on the inland ice of Greenland in 1751, in lat. 62° 31′ by the Danish merchant Lars Dalager, who penetrated nearly thirteen kilometres across a comparatively even plateau, and the unsuccessful attempt by Whymper in 1867, in lat. 69° 30′, where no progress was possible, in consequence of the difficult nature of the ground, only two serious attempts have been made to explore the interior of Greenland. The first of these was made by Dr. Berggren and myself between July 19 and 26, 1870, in lat. 68° 30′. Favoured by the most magnificent weather, we were able to penetrate nearly fifty kilometres across a country at the outset very difficult and rent by bottomless abysses, but which gradually improved in condition the further we advanced. We had on starting the company of two Eskimo, but they left us after two days' journey. As those who claimed to know the coast glaciers of Greenland had advised me not to waste time and labour on such a hopeless undertaking as that of penetrating over the inland ice, my outfit was very incomplete; we were in want of ropes, tent, suitable sledges, and on the Eskimo leaving us we could not even carry the utensils necessary for cooking. I could not therefore on that occasion get very far, but I certainly came to the conclusion, that I should have been able, with a couple of smart sailors or Arctic hunters and a suitable outfit, easily to have extended my wanderings to 200 or perhaps 300 kilometres. I may also mention here that in the month of June, 1873, I effected with Capt. Palander and nine sailors a journey of more than 190 kilometres over the inland ice of Spitzbergen, which journey was of special interest to me from the circumstance that I here learnt to know the character of inland ice before thaw sets in, as well as the difficulties which are at such a time attendant on journeys on the glaciers of the Polar regions. This experience, I believe, will be of great use to me during the journey now in course of preparation, as I shall have to cross portions of the inland ice which, on account of the altitude, will still be covered with snow at the time of my visit.

The second journey of research on the inland ice of Greenland was made between July 14 and August 4, 1878, in lat. 62° 40′, by the Danes, J. D. Jensen and A. Kornerup. This expedition was carefully equipped, but the country being much fissured, and the weather unfavourable, it did not reach much further inland than the Swedish of 1870.

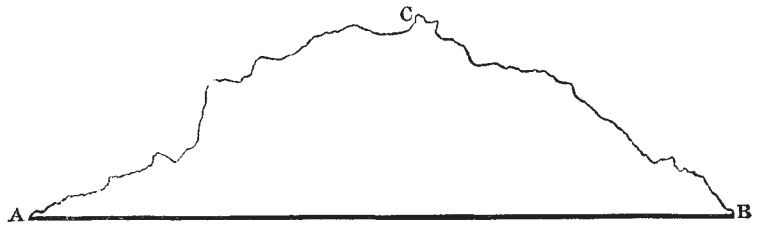
None of these expeditions saw any limit to the ice desert from their farthest point, but to infer from this that ice covers the whole interior of Greenland appears to me to be entirely unjustifiable. On the contrary, the following reflections seem to demonstrate that it is a *physical impossibility* that the whole of the interior of this extensive continent can be covered with ice, under the climatic conditions which exists on the globe south of the 80th degree of latitude.

The ice masses of the glaciers are commonly termed "permanent," a denomination which was once taken so literally that certain *savants* asserted that the ice in course of time was transformed into mineral crystals, such as those which are so frequently found in the clefts of the Alps. We know now that this term is entirely erroneous. The glacier which seems century after century to fill the same valley is not only in constant, although imperceptible, motion, by the ice masses which slowly advance from higher to lower elevations, but is also subjected to a change in its form by the circumstance that the lower stratum melts away through contact with the mountain on which it rests; while the surface on one side wastes away by thawing in the warm season and evaporation in the cold, and on the other is added to by falling snow, which latter after a time changes from snow dust to granular snow, then to crystals of ice, and eventually to a compact homogeneous mass of ice. And, if the advancing glacier is "fed" by enormous ice-fields, or what I may term "ice-lakes," situated so high that snow always falls there copiously, it can penetrate far below the border of the perpetual snow, yea, even to parts where the snow-fall is far from sufficient to make up for the loss of melting and evaporation. It is therefore clear, that glaciers, or other constant ice-masses, cannot form in places where they cannot be "fed" by descending ice, or where the snow-fall is less than the quantity which appears and disappears yearly; a circumstance which, among others, explains why no glaciers exist in the vicinity of the north polar coasts of the new or old world.

With regard to Greenland it is not difficult to demonstrate that the above-described conditions for the formation of glaciers do not exist there, if the country does not rise gradually both from the eastern and the western shore to the centre, and thus be like a loaf of bread in shape, and with sides slowly and symetrically terminating in the ocean. Such a land-formation is, however, not found in any part of the orography of the known world, and one may therefore safely conclude that neither is it to be found in Greenland. In fact, the geological nature of Greenland, very similar to that of Scandinavia, seems to indicate a similar orographical formation, viz., a formation formed of mountainous ridges alternating with deep valleys and plains; while one may even assume that the culminating line of the land in Greenland runs, as in England and Sweden, and in both American continents, along the west coast.

The winds, therefore, which should produce snow in the interior, must, if coming from the Atlantic, have in the first instance, crossed the broad ice-belt generally encircling the east coast of Greenland, and then the mountains on the coast, some of which we know are very high, and, if coming from Davis Sound, the mountain ridge itself. In both cases the wind would assume the character of the "Föhn" wind, *i.e.*, it must, after passing the mountain-chains on the coasts, be *dry and comparatively warm*. The law of the "Föhn" is, as is generally known, dependent on the circumstances explained below.

If *ACB* indicates a mountain, and a wind so dry that no deposit of moisture takes place on the top passes from *AC* to *B*, the air will certainly be chilled in passing *C*, in consequence of the lower barometric pressure and consequent expansion of the air; but the same cause which produces the lowering of temperature when the wind ascends has also the effect of liberating its heat, and the air will become warmer as it descends from *C* to *B*. The compression and rise of temperature are in the latter case precisely analogous to the expansion and fall of temperature in the former, and the dry air, in passing



the mountain, has, therefore, on reaching *B*, not suffered any change whatever in temperature or quantity of moisture. Quite different will, however, be the result if the air ascending at *A* is saturated with moisture, as, for instance, air passing a great expanse of water. In that case the air will expand and become colder, just as it ascends from the water surface to the mountain top, but, at the same time, part of the moisture will be condensed on the top, whereby the latent heat of the hydrogen will be set free and a rise of temperature take place, and this will, to a certain extent, minimise the fall of temperature caused by the expansion of the air. The air will retain the heat thus set free, even after it has reached, in a dry state, the point *B*, and the air, originally moist, has, when it has passed the mountain, attained a higher degree of heat, but less moisture than at the moment of ascending. *It is in fact dry and warm.*

These causes are not only the reason of the dry warm "Föhn" winds in Switzerland, and the very remarkable circumstance that it is under winds from the snow-covered mountains that the snow disappears in Swedish Lappland, but they play also an important part in the climatic conditions of the whole globe. They are, for example, the cause of the difference in climate and flora of the two sides of the Andes, of the east and west coasts of Tierra del Fuega, and the eastern and western parts of Australia. They are the chief cause of the deserts which cover the interiors of Asia, Australia, the northern portion of Africa, and certain parts of America, while in Sweden they produce the constant western winds, and the consequent prolonged drought which invariably occurs in spring time in the central part of the country. The same laws of the temperature and moisture of the air must also prevail in Greenland. Here too the ocean winds must be moist, and this moisture is usually deposited in the form of snow on the mountains along the coast, whereas all those reaching the interior, whether from east, west, north, or south, must—if the orographical construction of the country is not entirely different from that of others on the globe—be dry and comparatively warm. And in consequence of this circumstance, the snow-falls in the interior of Greenland cannot be sufficient for maintaining a "perpetual" inland ice.

It cannot, however, be asserted that the country should here form a deserted, treeless tundra; one encounters in Siberia forests with giant trees under climatic conditions far more severe than those we may assume are to be found in the interior of Greenland. That the country should prove true to its name has besides been asserted by the celebrated botanist Hooker, from his studies of the flora of Greenland, and even the natives on the west coast themselves have a suspicion that such is the case, from the large herds of reindeer which from time to time are seen to migrate across the inland ice to the west coast.

It is most probable that the interior, if free from ice, is like a North European high plateau, with a flora far more copious than that of the coast.

But this I maintain, that whether the interior of Greenland is richly covered with forests, as the land round the frigid pole of Siberia, or is a treeless, ice-free tundra, or even a desert of perpetual ice, the solution of the problem of its real nature is so important, and of such consequence to science, that there could hardly, at the present moment, be conceived an object more worthy of an Arctic expedition than to ascertain the true conditions of the interior of this particular country.

Besides the object of penetrating to the interior of Greenland, the expedition will have several others in view, of which I may mention the principal:—

To Fix the Limit of the Drift-ice between Iceland and Cape Farewell, and to take Soundings and Dredgings in the Adjacent Seas

This part of the Atlantic has hardly ever been subjected to any other kind of examination than that made on laying the first cables. A knowledge of the same is, however, of great importance, both for completing the missing link in the hydrographic chain of the Ocean dividing Europe and America, and for the discovery of the causes of the change in the ice-conditions in the seas of the east coast which seem to have taken place since Greenland was first discovered. Without much waste of time the expedition may be occupied with these researches during the voyage from Iceland to the Greenland promontory, which will take place in a season when fine weather may be presumed to reign here, while they may, although with less probability of being favoured by this condition, be effected during the return journey.

The Collection of Fresh Specimens of the Flora of the Ice and Snow

Professor Wittrock is at present engaged in publishing a very interesting and important work on the microscopic flora, with several varieties, whose home is in the snow and ice-fields of the Alps and the Polar regions, for which materials have been brought home from the latter by the Swedish Arctic expeditions. My expedition will, during the coming visit to Greenland, be in a position to gather further materials for researches, which have already revealed to us the startling fact, that even snow and ice can form the bed for a flora regular in development, and of many varieties.

New Systematic Researches of the Strata which in Greenland contain Fossil Plants

From the previous Swedish Arctic expeditions, and through the publications in the *Journal* of the Swedish Academy of Sciences of articles by Prof. Oswald Heer, of Zurich, we know that students of science have received during the last twenty years from the sandstones and slates of North Europe an additional abundant material for determining the pre-historic climatic conditions of the earth; as well as a knowledge of the certainly variable, but even in the last geological era copious, flora which during these ages existed in the present ice-covered regions of the pole. It is well known, that valuable materials for the study of this phenomenon has been collected in Greenland by English, Danish, and Swedish explorers; but hitherto what has been brought home has been gathered under very difficult conditions, and generally by men who have not been students of the science in question, viz., palæontology. I hope to attach to my coming expedition one of the most celebrated students of this science, and if this be the case, the expedition will undoubtedly bring home novel and circumstantial details relating to this important chapter of the history of the earth. This task is so much easier to accomplish as the richest fields for the discovery of such fossil objects are situated just where it is my intention to invade the inland ice. During the period I shall be absent wandering on the ice, the other members will be occupied in this pursuit.

The Collection of New Data Connected with the Fall of Cosmic Dust

It is clearly demonstrated by the discovery of cobalt containing iron particles in fresh snow in Europe, and the carbon-dust, also containing cobalt-iron, which is found on the ice-fields north of Spitzbergen, as well as by the appearance of metallic iron in "krykonit," a remarkable dust which I brought home from the Greenland ice, that the fall of a small quantity of cosmic dust always takes place, regularly or periodically, most probably in every part of the globe. But that there is a greater variation in the nature of this fall than is generally assumed, is clearly indicated by the discoveries which were made in the *Vega* expedition, viz., of tiny yellow crystals in the snow on an ice-plateau near the Taimur peninsula. This certainly necessitates fresh researches into this phenomenon, in order to settle questions of great moment to geology and cosmology. It is very difficult to investigate this feature of cosmology, in consequence of the small quantities of dust which falls, and when it takes place in closely populated districts, covered by dwellings and factories, and where the ground is perhaps only clad in snow during a short period of the season. The Polar countries, on the other hand, are particularly suited for researches of this kind, both in consequence of the purity of the air and the absence of terrestrial dust, and by the ease with which the dark dust-particles are noticed on pure snow. The coming expedition will, while steaming along the ice-belts between Iceland and Greenland, and during my wanderings on the ice, be able to direct a great deal of attention to these captivating problems.

Should the conditions of the ice in Baffin's Bay be favourable, and the vessel, when in the vicinity of Disco Island, have sufficient coals for a journey northwards, or should it be possible to obtain a sufficient supply from the beds found in these parts, it would be highly desirable that the members remaining on board whilst I am away on the inland ice make an excursion along the west coast as far as Cape York.

There are, according to statements made to the Arctic explorers Ross and Sabine, lying here on a mountain, Savilik, *i.e.*, the iron mountain, lat. 76° 10′, a couple of large, round, solitary iron blocks, from which the natives obtain the little supply of iron which they require for hunting implements and domestic utensils. The metallic constituents of these blocks are, according to an analysis made of one of these utensils brought home, iron and a small percentage of nickel, and, to judge from the descriptions by the Eskimo, these blocks are of the same nature as those which I discovered in 1870 at Ovifak, on Disco Island. It is very strange that the remarkable descriptions by Ross and Sabine should not have been the object of investigation by the many Arctic explorers who have passed this spot. An opportunity is now at hand to ascertain the much-disputed nature and origin of these iron blocks, while a few days' sojourn on this part of the coast, which is so little known, ought to be of considerable scientific value, especially as the geological features here are similar to those on Disco Island,—strata bearing fossil plants.

This expedition will, as has been the case with previous Swedish Arctic expeditions, be accompanied by a specially selected scientific staff, whose members will individually contribute to make the expedition worthy of earlier achievements, and who will lose no opportunity of adding to our knowledge of the Polar regions. They will attempt to solve some of the many problems which await investigation in the far north. It is, however, impossible to detail at length the researches which may be undertaken, as these must depend on the nature of the special studies to which the members have devoted their time.

There is, however, one more object of research to be mentioned, which should not be lost sight of by any expeditions to Greenland, viz., to attempt to solve the question: Where were the former Norse colonies, Eriksfjord, Brattelid, Garda Cathedral, Herjolfsnæs, and others situated? This question has already been answered by the most eminent students of the early history of Greenland, who maintain that the ancient Österbygd lies west of the southern part of the island, between Cape Farewell and lat. 61°, and the Vesterbygd, a little north of the west coast. But it appears to me that, if the Icelandic Sagas are examined carefully, and without any preconceived opinion, it will become apparent that former investigators of this problem have been led astray, and that the true Eriksfjord, with its cathedral and numerous parishes, has never been found, but must be sought for on the inaccessible east coast north of Cape Farewell.

With the experience I have of the conditions of the ice in other parts of the Polar seas, I believe that this coast may be reached, without much difficulty, by sailing in the autumn from the south in the ice-free channel, which I have every reason to believe forms along this coast. This journey will, however, not be begun until the commencement of September, and this circumstance will exactly fall in with the plan in view, viz., on returning from the inland ice to attempt this voyage of discovery.

With the premises I have here detailed before me, I now have to suggest the following plan for the journey of the expedition:—

The expedition should leave Sweden near the end of May in a suitable, but not too large, steamer built of Swedish iron and constructed with water-tight compartments. And although the journey is intended for the summer months only, it should be provisioned for one year, and be provided with the necessary winter outfit, with the scientific instruments desirable, and accoutrements which would be of service for the journey on the inland ice. The steamer should be navigated by a man accustomed to sailing in the Arctic seas, whilst there ought also to be on board as ice-master a skipper who has hunted in the Arctic. The scientific staff should, besides the commander, consist of four persons, the doctor included.

From Sweden the steamer should steam to a port in Scotland, where more coals are to be taken on board, and the journey continued to Reikiavik in Iceland. There a

stay will be made for a few days, when the edge of the ice in the west will be made for, which will be followed southwards, but no attempt should then be made to penetrate the pack. Only in case there should be found an open lead, which is not expected, this will be entered. The probability of this is, however, very small. After having passed Cape Farewell, the vessel will call at Ivigtuk, where again it will be coaled from the depots which have been laid up here for the use of the steamer. The course will then be shaped for the west coast of Greenland, probably calling at Egedesminde, to the Auleitsivik Fjord, from the bottom of which the ice-journey will be commenced.

This latter will occupy, it is estimated, thirty to forty days, and should be finished thus by the middle of August next. During this time the vessel will steam through the Waigatt to Omenak, where the many deposits of fossil plants will be visited. If the ice and coals should permit, the vessel will steam northwards, if possible as far as Cape York, whereby an excellent opportunity will be offered for geological, mineralogical, botanical, and zoological studies. In the middle of August the vessel will again be due in the Auleitsivik Fjord, and taking the members of the ice-expedition on board, will steam south to Ivigtuk, where a few days' stay will be made for coaling, etc. From here the vessel will steam round Cape Farewell, along the east coast in the open channel, which I expect to find there at that season; and my intention is then, with due reference to the old geographical descriptions of the Icelandic Sagas, carefully to search the fjords which may be accessible.

At the end of September the return journey will be commenced outside the belt of pack-ice to Reikiavik and home.

The distances the vessel will cover are, in round figures, these :—

				Nautical Miles
GOTHENBURG ...	to	THURSO		500
THURSO	„	REIKIAVIK		700
REIKIAVIK	„	IVIGTUK		870
IVIGTUK	„	AULEITSIVIK FJORD		540
AULEITSIVIK FJORD	„	OMENAK		330
OMENAK	„	CAPE YORK		400

A. E. NORDENSKIÖLD

NOTES

THE Fifty-third Annual Meeting of the British Association will commence on Wednesday, September 19, 1883, at Southport. The President Elect is Arthur Cayley, LL.D., F.R.S., Sadlerian Professor of Mathematics in the University of Cambridge. The Vice-Presidents Elect are the Right Hon. the Earl of Derby, the Right Hon. the Earl of Crawford and Balcarres, the Right Hon. the Earl of Lathom, Prof. J. G. Greenwood, LL.D., Prof. H. E. Roscoe, LL.D., F.R.S. The General Treasurer is Prof. A. W. Williamson, Ph.D., F.R.S., University College, London. The General Secretaries are Capt. Douglas Galton, C.B., F.R.S., and A. G. Vernon Harcourt, F.R.S. The Secretary is Prof. T. G. Bonney, F.R.S. The Local Secretaries are J. H. Ellis, D. Vernon, T. W. Willis; and the Local Treasurer the Mayor of Southport. The Sections are the following :—A.—Mathematical and Physical Science.—President: Prof. Henrici, F.R.S. Vice-Presidents: Prof. Balfour Stewart, M.A., LL.D., F.R.S., F.R.A.S.; Prof. Stokes, M.A., D.C.L., LL.D., Sec.R.S. Secretaries: W. M. Hicks, M.A.; Prof. O. J. Lodge, D.Sc.; D. McAlister, M.A., M.B., D.Sc. (Recorder); Prof. Rowe, M.A., B.Sc. B.—Chemical Science.—President: J. H. Gladstone, Ph.D., F.R.S. Vice-Presidents: Hugo Müller, Ph.D., F.R.S., For. Sec. C.S.; Prof. T. E. Thorpe, Ph.D., F.R.S., F.C.S. Secretaries: Prof. P. Phillips Bedson, D.Sc., F.C.S. (Recorder); H. B. Dixon, M.A., F.C.S.; H. Foster Morley, M.A., B.Sc., F.C.S. C.—Geology.—President: Prof. W. C. Williamson, F.R.S. Vice-Presidents: Prof. W. Boyd Dawkins, M.A., F.R.S., F.S.A., F.G.S.; J. W. Hulke, F.R.S., Pres.G.S. Secretaries: R. Betley, F.G.S.; C. E. de Rance, F.G.S.; W. Topley, F.G.S. (Recorder); W. Whitaker, B.A., F.G.S. D.—Biology.—President: Prof. E. Ray Lankester, F.R.S. Vice-Presidents: Prof. Gamgee, M.D., F.R.S.; W. Pengelly, F.R.S., F.G.S.; Prof. Schäfer, F.R.S.; W. T. Thiselton Dyer, M.A., B.Sc., F.R.S., F.L.S. Secretaries: G. J. Haslam, M.D.; W. Heape; Prof. A. M. Marshall, M.A., M.D., D.Sc.; Howard Saunders, F.L.S., F.Z.S. (Recorder); G. A. Woods. Department of Anthropology: W. Pengelly, F.R.S., F.G.S. (Vice-President), will preside. Secretaries: G. W. Bloxam, M.A., F.L.S. (Recorder); Walter Hurst. E.—Geography.—President: Lieut.-Col. H. H. Godwin-Austen, F.R.S., F.G.S., F.R.G.S. Vice-Presidents: Sir Rawson W. Rawson, K.C.M.G., C.B., F.R.G.S.; The Rev. Canon Tristram, M.A., LL.D., F.R.S., F.L.S. Secretaries: John Coles, F.R.A.S., F.R.G.S.; E. G. Ravenstein, F.R.G.S.; E. C. Rye, F.Z.S. (Recorder). F.—Economic Science and Statistics.—President: R. H. Inglis Palgrave, F.R.S., F.S.S. Vice-Presidents: Prof. R. Adamson, M.A., LL.D.,; J. Heywood, F.R.S., F.G.S., F.S.A., F.S.S. Secretaries: Prof. H. S. Foxwell, M.A., F.S.S.; J. N. Keynes, M.A., B.Sc.; Constantine Molloy (Recorder). G.—Mechanical Science.—President: James Brunlees, F.R.S.E., F.G.S., Pres. I.C.E. Vice-Presidents: W. H. Barlow, F.R.S., M.I.C.E.; Prof. Osborne Reynolds, M.A., F.R.S. Secretaries: A. T. Atchison, M.A., C.E.; Edward Rigg, M.A.; H. T. Wood, B.A. (Recorder). The first general meeting will be held on Wednesday, September 19, at 8 p.m., when Sir C. W. Siemens, D.C.L., LL.D., F.R.S., F.C.S., M.I.C.E., will resign the Chair, and Prof. Cayley, M.A., LL.D., F.R.S., V.P.R.A.S., President Elect, will assume the Presidency, and deliver an address. On Thursday evening, September 20, at 8 p.m., there will be a soirée; on Friday evening, September 21, at 8.30 p.m., a Discourse on Recent Researches on the Distance of the Sun, by Prof. R. S. Ball, LL.D., F.R.S., Astronomer Royal for Ireland; on Monday evening, September 24, at 8.30 p.m., a Discourse on Galvani and Animal Electricity, by Prof. J. G. McKendrick, M.D., LL.D., F.R.S.E., Professor of Physiology in the University of Glasgow, and in the Royal Institution of Great Britain; on Tuesday evening, September 25, at 8 p.m., a soirée; on Wednesday, September 26, the concluding general meeting will be held at 2.30 p.m.

THE number of members of the British Association who have announced their intention of being present at the proposed meeting at Montreal in 1884, continues to increase, and now exceeds 410. It is stated that Lord Rayleigh has accepted the presidency for the Canadian meeting.

PROF. HUXLEY has been elected a Foreign Member of the U.S. National Academy.

FROM a list of seven names proposed by the Incorporated Societies throughout the colony, the following gentlemen have been elected honorary members of the New Zealand Institute :—Sir William Thomson, F.R.S., Professor of Natural Philosophy, University of Glasgow; Dr. W. B. Carpenter, F.R.S., C.B., of London; and Mr. R. L. J. Ellery, F.R.S., Government Astronomer at Melbourne.

PROF. TYNDALL has resigned his position as Scientific Adviser to the Board of Trade and the Lighthouse Boards.

WE are glad to see the ample recognition of music during the present week by the conferring of knighthood on Messrs. Sullivan, Grove, and Macfarren in connection with the New College of Music. Let us hope that the science of music as well as the art will receive due cultivation in the new institution; with Sir George Grove's well-known wide sympathies, however, this may be taken for granted.